N° 18,862 A.D. 1902

Date of Application, 27th Aug., 1902—Accepted, 27th Nov., 1902

COMPLETE SPECIFICATION.

A Device for the Transfusion of Blood and for the Injection of Medicaments into the Human Body.

We, JULIUS LIEBERG and HEINRICH LIEBERG, both of 15, Schlessplatz, Cassel, Prussia: Gentlemen, do hereby declare the nature of this invention, and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement;—

For the purpose of injecting either neutral liquids or medicaments into the human system, or for transfusion of blood from a healthy body to a diseased or anæmic body, either syringes or irrigators were hitherto used, or for transfusion of blood, simple gut or rubber tubes,—in either case the introduction of the medicaments or blood was effected in successive thrusts especially if large quantities were in question. In consequence of these thrusts and their irregularity, the injection was exceedingly painful to the patient. Nor could the correct temperature of the body be attained; moreover air sometimes entered the veins, as a constant uniform jet could not be obtained.

The object of the present invention is to obviate these evils and to prevent air from entering the veins in transfusing blood or injecting medicaments or neutral liquids, and to ensure at the same time, that the medicaments shall be introduced into the system of the patient at the right temperature. According to this invention, an air pump, made entirely of glass or some other sterilisable material, with suction and delivery valves, is used, the delivery pipe being connected, by an antiseptically prepared flexible tube or the like, with the cannula and the suction pipe being either inserted direct into the vein supplying the blood to be transfused, or, if medicaments or neutral fluids are to be injected, with a receptacle, provided with a heating arrangement, and which contains these fluids.

The annexed drawing illustrates a form of construction of this arrangement, where

Fig. 1. is an elevation in partial section, and

Fig. 2. is a plan.

On a base board 2, provided with indiarubber feet 1, is arranged a cooking-stove frame 4 carrying a removable boiling vessel 3, and provided with an adjustable heating arrangement 5. The pot 3 is filled for use, with water up to a certain height, and is provided with a thermometer 6, by means of which the temperature of the water can be ascertained.

Within the vessel 3 is a removable graduated vessel 7, which may be made of glass, in the shape of a bottle or the like, and which serves as the receptacle for the medicament to be injected,—say for instance, chloride of sodium solution. The removable stopper for closing this vessel,—which stopper may be suitably made of antiseptically prepared indiarubber, glass or the like, has inserted into it hermetically a syphon tube 9, which may be made of glass, and the end of which 10 nearly touches the bottom of the vessel 7 and terminates in a funnel-shaped or bell mouth. A glass tube 11 open at both ends, is hermetically inserted in the stopper 8. The pear-shaped head 12 of the tube 11 contains a filtering medium,—say for instance antiseptically prepared cotton-wool, by which the air entering the vessel 7 on withdrawal of fluid from the vessel, by suction,

is filtered and purified, so that any germs of disease, which might be contained in the outer atmosphere, cannot pass into the interior of vessel 7.

The syphon tube 9 is connected with the suction pipe 15 of the air pump 16 by an antiseptically prepared tube 14, of rubber or the like. 17 is the suction valve, 18 is the delivery channel of the pump, and 19 the delivery valve arranged in the latter. The delivery channel 18 is connected, by means of a readily detachable, antiseptically prepared tube 20 of rubber or the like, with a small glass tube 21 having a conical end 22 on which the cannula 23 is fixed in a known manner, so that it can be readily detached.

The pump cylinder 16 is provided with handles 24, arranged so that the fingers can be put through them, for the purpose of grasping the pump more conveniently. The pump is inserted in a casing 26, formed of wood, in two halves held together by screws 25, in a readily detachable manner, and fastened on the base board 2.

If the pump is used for injecting a medicament, for instance chloride of sodium solution,—it is placed in the position shown in the drawing. In order to be able to observe, from outside, the level occupied by the fluid at any moment in the pump cylinder, the casing 26 is provided with a longitudinal slot 27.

For transfusion of blood, the pump 16 is removed from the casing, by undoing the screws 25, and the tube 14 is detached from the syphon tube 9 of vessel 7. The loose end of tube 14 is then put in communication with the vein of the healthy body, the cannula 23 is inserted in a fold of the skin of the body, and the pump 16 is set in operation.

The pump being provided with a suction and delivery valve, likewise made of glass, the introduction of blood or medicaments does, not take place jerkily, but in the form of an uninterrupted jet, which can be regulated, at will, to be weak or strong. Consequently the introduction of air, with the liquid, into the system, may be considered to be entirely precluded.

The air pump and its valve being made entirely of glass or some other sterilisable material, may be easily cleansed, and all the parts of the apparatus described, being made of glass or some antiseptically prepared smooth material, may also be kept free from microbes.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

A means for transfusion of blood and for injection of medicaments or neutral fluids into the human system, comprising an air pump (16) made entirely of glass or some other transparent material which can be easily kept free from microbes, and fitted with suction and delivery valves,—its delivery channel (18) being connected, by an antiseptically prepared flexible tube or the like (20), with the cannula (23) and its suction channel (15) being either put into direct communication with the vein supplying the blood for transfusion or, if medicaments or neutral fluids are to be introduced into the patient's system, connected, by an antiseptically prepared channel (14), with a vessel of the same nature (7), containing the medicament, and fitted with a heating arrangement.

Dated this 27th day of August 1902.

J. E. EVANS-JACKSON & Co.,
Agents for the Applicants.

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LIEBERG & *another's* Complete Specification. *(1 SHEET)*

Fig. 1.

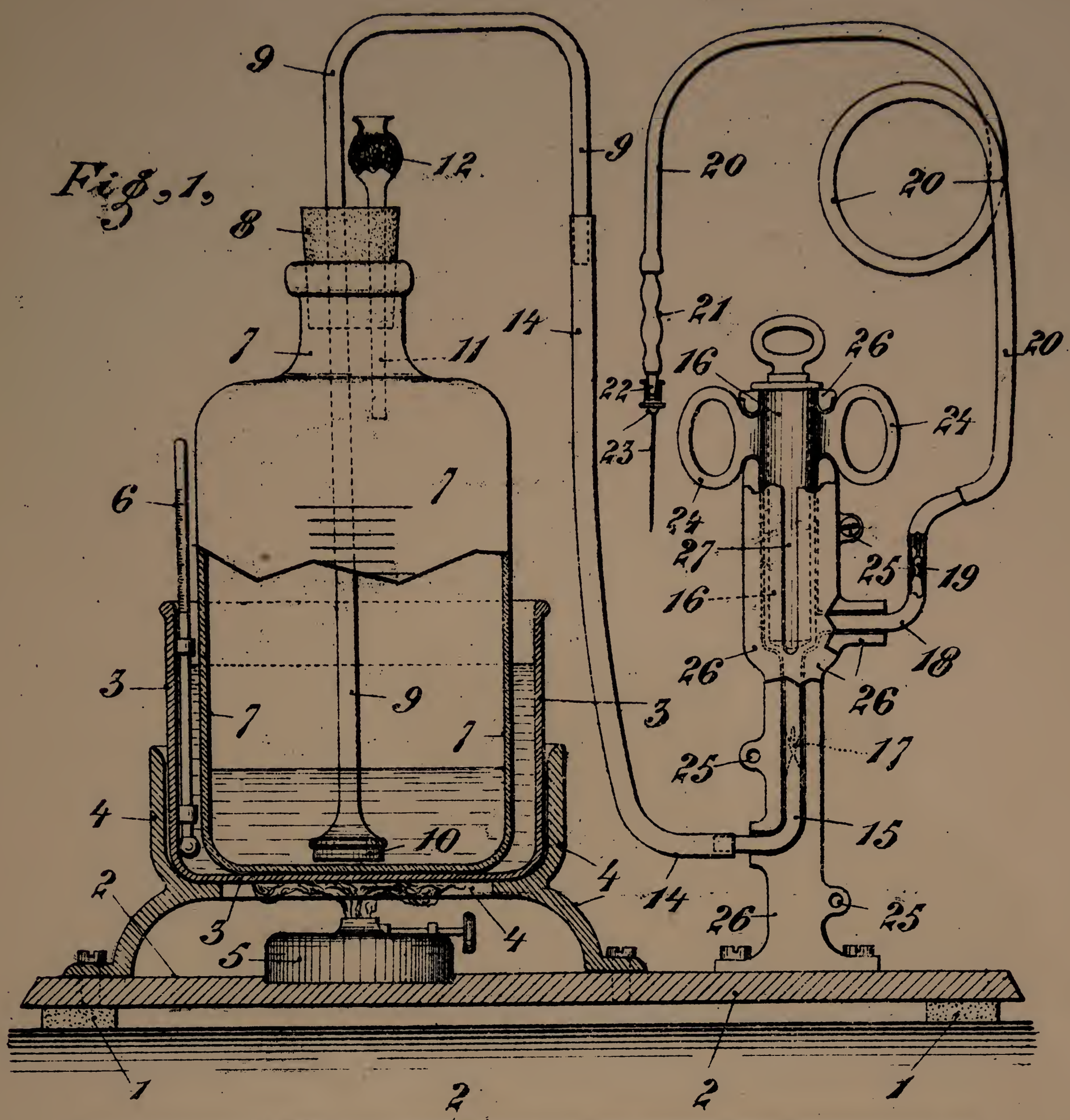
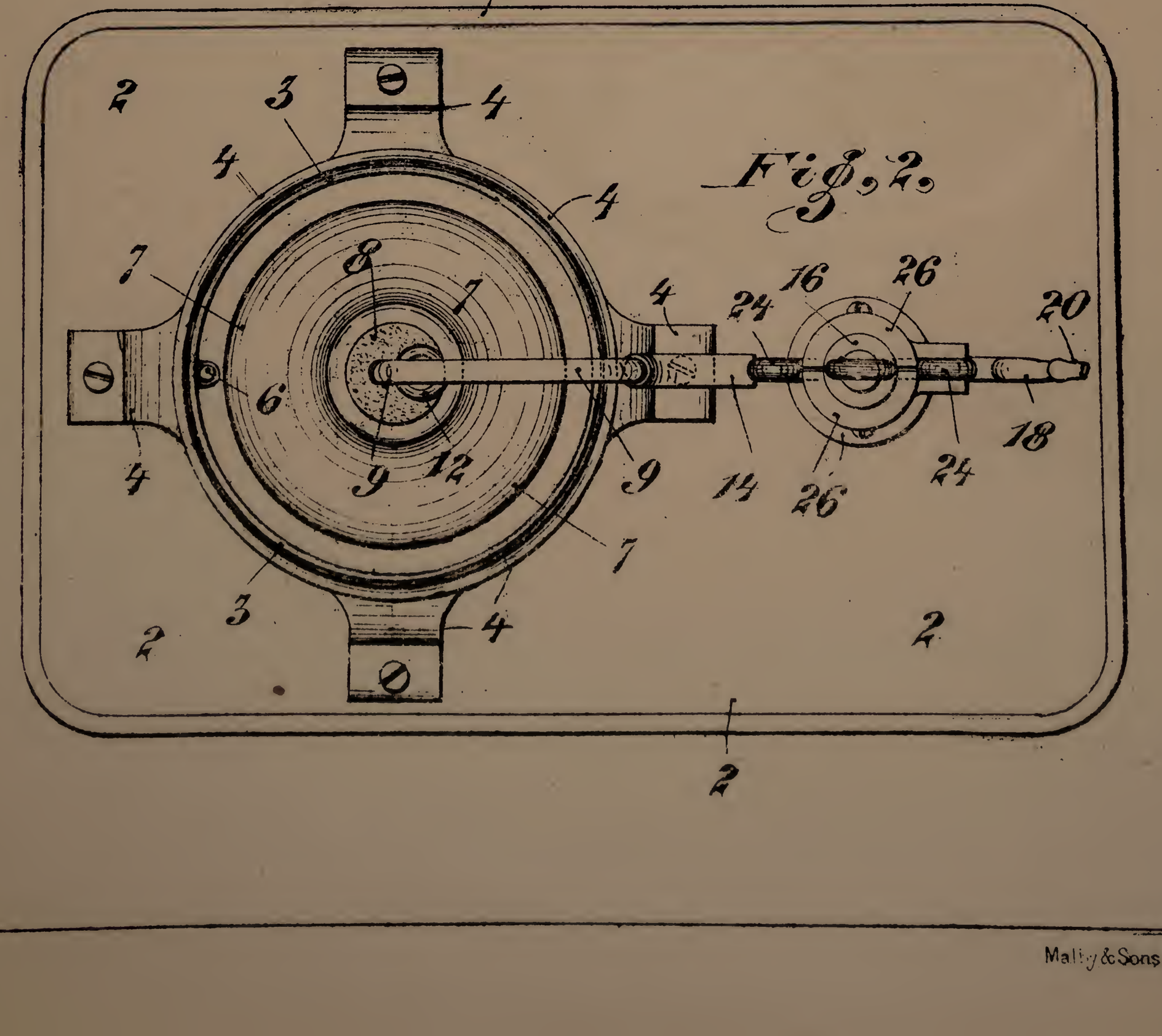


Fig. 2.



[This Drawing is a reproduction of the Original on a reduced scale.]

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